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**BEFORE THE BOARD OF PATENT APPEALS  
AND INTERFERENCES**

Application Number: 10/015,492  
Filing Date: December 13, 2001  
Appellant(s): BERTIS, VIKTORS

\_\_\_\_\_  
Robert H. Frantz (Reg. No. 42,553)  
For Appellant

**EXAMINER'S ANSWER**

This is in response to the appeal brief filed on October 12, 2005 appealing from the Office action  
mailed May 15, 2005.

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***(1) Real Party in Interest***

A statement identifying by name the real party in interest is contained in the brief.

***(2) Related Appeals and Interferences***

The following are the related appeals, interferences, and judicial proceedings known to the examiner which may be related to, directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal:

- US Patent Application Number: 10/015,880

***(3) Status of Claims***

The statement of the status of claims contained in the brief is correct.

***(4) Status of Amendments After Final***

No amendment after final has been filed.

***(5) Summary of Claimed Subject Matter***

The summary of claimed subject matter contained in the brief is correct.

***(6) Grounds of Rejection to be Reviewed on Appeal***

The appellant's statement of the grounds of rejection to be reviewed on appeal is correct.

***(7) Claims Appendix***

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A substantially correct copy of appealed claims 18 and 19 appears on page 12 of the Appendix to the appellant's brief. The minor errors are as follows:

- Claim 18 improperly depends on itself and should depend on claim 17.
- Claim 19 improperly depends on claim 18 and should depend on claim 17.

Note: A corrected claims appendix is attached with this Examiner's answer.

### ***(8) Evidence Relied Upon***

#### Evidence Used for Rejection(s)

- US 4,574,311                      Resnikoff et al.                      3-1986
- Balph, Tom, LFSR counters implement binary polynomial generators, May 21, 1998, EDN, [http://edn.com/archives/1998/052198/11df\\_06.htm](http://edn.com/archives/1998/052198/11df_06.htm).

#### Supplementary Evidence NOT Used in the Rejection(s)

- Sung, R., Sung, A., Chan, P., Mah, J., "Linear Feedback Shift Register", [http://www.ee.ualberta.ca/~elliott/ee552/studentAppNotes/1999f/Drivers\\_Ed/lfsr.html](http://www.ee.ualberta.ca/~elliott/ee552/studentAppNotes/1999f/Drivers_Ed/lfsr.html).
- Texas Instruments, "What's an LFSR?", 1996, <http://focus.ti.com/lit/an/scta036a/scta036a.pdf>.

### ***(9) Grounds of Rejection***

The following ground(s) of rejection are applicable to the appealed claims:

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Resnikoff et al. (hereinafter "Resnikoff") [US 4,574,311] in view of Balph [NPL document, "LFSR counters implement binary polynomial generators"].

Regarding claim 1, Resnikoff discloses the following claim limitations:

A method of producing a two-dimensional sensor array for imaging, comprising the steps of *[Figure 9b: Figure discloses a randomly placed sensor array according to the disclosed invention.]*; determining a plurality of sensor positions, each position having a spacing in a first axis from a datum point according to a first non-uniform distribution schema, and each position having a spacing in a second axis from said datum point according to a second non-uniform distribution schema *[Column 5 Lines 45-49, Column 8 Lines 28-32: Cited reference discloses the Poisson disc process, which is a non-uniform distribution schema. This schema is applied to two axes (x and y) to determine the position of sensors for a datum point. Since, the values derived are for each axes are independent of the other, this acts as two schemas.]*; providing a two-dimensional array of sensors, each sensor being positioned on said array according to the determined positions in said first and second axes and *[Figure 9b, Column 8 Lines 28-32]*; providing a means for sampling

said sensors such that a two dimensional imaging sensor array having non-uniform sensor distribution is realized *[Column 7 Lines 55-62]*.

Resnikoff does not explicitly disclose the non-uniform schema being “predictable deterministic”.

However, in the same field of endeavor Balph discloses a non-uniform predictable deterministic distribution schema *[Page 1, Column 1 Paragraph 1 and Column 2 Paragraph 1: Cited reference discloses the use of linear feedback shift registers to generate pseudorandom numbers, these numbers are predicatively determined by the polynomial chosen.]*.

It would have been obvious to one with ordinary skill in the art at the time of invention to modify the teachings of Resnikoff with Balph to utilize a non-uniform predictable deterministic distribution schema for sensor placement. The motivation being that linear feedback shift registers reduce the amount of logic *[Page 1, Column 1 Paragraph 1]*.

Regarding claim 2, Resnikoff discloses the following claim limitations:

The method as set forth in Claim 1 wherein said first schema comprises a pseudo-random schema *[Column 4 Lines 22-26]*.

Regarding claim 3, Balph discloses the following claim limitations:

The method as set forth in claim 1 wherein said first schema comprises a nonlinear polynomial schema *[Column 2 Paragraph 1]*.

Regarding claim 4, Balph discloses the following claim limitations:

The method as set forth in Claim 1 further comprising the step of assigning one or more reference identifiers to said first and second non-uniform distribution schema

*[Figure 1: Disclosed polynomial  $X^2+X+1$  acts reference identifier to the distribution schema. One can easily identify the type of distribution being used from the polynomial notation.]*

Regarding claim 5, Resnikoff discloses the following claim limitations:

The method as set forth in Claim 1 wherein said second schema comprises a pseudo-random schema *[Column 4 Lines 22-26]*.

Regarding claim 6, Balph discloses the following claim limitations:

The method as set forth in claim 1 wherein said second schema comprises a nonlinear polynomial schema *[Column 2 Paragraph 1]*.

Regarding claim 7, Resnikoff et al. discloses the following claim limitations:

The method as set forth in Claim 1 further comprising the steps of: creating a dithered set of data samples by sampling said non-uniformly spaced sensors, said dithered set of data samples representing an image; and *[Column 7 Lines 55-62: Cited reference discloses the sampling of non-uniformly spaced sensors, this would produce the dithered set of data samples.]*; performing interpolation to synthesize a set of data samples representing uniformly spaced data samples from said dithered set of data samples, said uniformly spaced data samples representing said image according to uniformly distributed sensors *[Column 9 Lines 22-29, Column 11 Lines 3-5: Cited reference discloses interpolation being performed to create an high resolution image array. This array would have to be*



*uniform, since it is being displayed on a monitor, which is known to have uniform horizontal and vertical distributions.].*

Regarding claim 8, Resnikoff et al. discloses the following claim limitations:

The method as set forth in Claim 7 wherein said step of performing interpolation to synthesize a set of data samples representing uniformly spaced data samples comprises performing linear interpolation *[Column 9 Lines 48-52]*.

Regarding claim 9, all claimed limitations are set forth and rejected as per discussion for claims 1 and 7.

Regarding claim 10, all claimed limitations are set forth and rejected as per discussion for claims 9 and 8.

Regarding claim 11, Resnikoff discloses the following claim limitations:

The computer readable medium as set forth in Claim 9 further comprising software for performing the step of receiving a reference identifier associated with distribution schema of said dithered data set, and wherein said software for performing interpolation comprises software for performing interpolation based upon said distribution schema *[Column 9 Lines 30-68: Disclosed reference performs interpolation based on sensors distribution information.].*

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Regarding claim 12, all claimed limitations are set forth and rejected as per discussion for claims 1 and 7.

Regarding claim 13, all claimed limitations are set forth and rejected as per discussion for claims 12 and 2.

Regarding claim 14, all claimed limitations are set forth and rejected as per discussion for claims 12 and 3.

Regarding claim 15, all claimed limitations are set forth and rejected as per discussion for claims 12 and 5.

Regarding claim 16, all claimed limitations are set forth and rejected as per discussion for claims 12 and 6.

Regarding claim 17, all claimed limitations are set forth and rejected as per discussion for claims 12 and 7.

Regarding claim 18, all claimed limitations are set forth and rejected as per discussion for claims 12 and 8.

Regarding claim 19, all claimed limitations are set forth and rejected as per discussion for claims 12 and 11.

## ***(10) Response to Argument***

### Brief Summary

A brief technical summary is provided to establish and clarify the technical subject matter as it pertains to the current appeal.

### Applicant's Instant Invention

<b>Technical Area</b>	Positioning of imaging sensor elements <i>[Figure 5]</i> .
<b>Problem to be Solved</b>	Mitigate the effects of moiré patterns (i.e. aliasing) <i>[See specification, Page 10, Lines 1-5]</i> .
<b>Method Used</b>	Non-uniformly placing the sensor elements <i>[See specification, Page 10, Lines 1-5]</i> , using a non-linear mathematical function, pseudo-random or a predictable process to generate the numbers need for sensor placement <i>[See specification, Page 12 Lines 6-9]</i> .

### Resnikoff et al. ("Resnikoff") Patent

<b>Technical Area</b>	Positioning of imaging sensor elements <i>[Figure 9(b)]</i> .
<b>Problem to be Solved</b>	Mitigate the effects of moiré patterns (i.e. aliasing) <i>[Column 4 Lines 46-50]</i> .
<b>Method Used</b>	Non-uniformly place the sensor elements <i>[Figure 9(b)]</i> , using a non-linear mathematical function <i>[Column 8 Lines 21-32]</i> to generate the numbers needed for sensor placement.

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Balphy Reference

<b>Technical Area</b>	Number generator [Page 1, Column 1, Paragraph 1].
<b>Problem to be Solved</b>	Generating predictable pseudorandom numbers [Page 1, Column 2, Paragraph 2].
<b>Method Used</b>	Generate predictable pseudorandom numbers using linear-feedback shift registers [Page 1, Column 2, Paragraph 2; Figure 1].

Examiner's Response to Arguments

Claim Rejections – 35 USC § 103 (Claims 1-19)

Summary of Arguments:

1. References Are Not In Same Field of Endeavor
  - a. Resnikoff and Balph are not in the same field of endeavor [Appeal Brief: Page 3, Paragraph 4].
  - b. There is no suggestion in Resnikoff to replace the probabilistic function with a deterministic function [Appeal Brief: Page 3, Paragraph 4].
2. No Suggestion or Motivation Found; Misinterpretation of Balph's Object
  - a. Balph's suggestion regarding logic minimization applies to logic of traditional binary counter designs and not to the number generator of Resnikoff [Appeal Brief: Page 4, Paragraph 4].
  - b. There is not motivation to combine Resnikoff and Balph for the following reasons,  
(2.b.1) Uniform and Poisson distribution are not the same;

(2.b.2) replacing Resnikoff's Poisson distribution function with a uniform distribution function may render Resnikoff undesirable for its intended function;

(2.b.3) Resnikoff in view of Balph fails to teach all of our claimed steps, elements, and limitations [*Appeal Brief: Page 6, Paragraph 2*].

Examiner's Response:

1. References Are Not In Same Field of Endeavor

- a. It has been held that a prior art reference must either be in the field of applicant's endeavor or, if not, then be reasonably pertinent to the particular problem with which the applicant was concerned, in order to be relied upon as a basis for rejection of the claimed invention. See *In re Oetiker*, 977 F.2d 1443, 24 USPQ2d 1443 (Fed. Cir. 1992). In this case, Resnikoff, Balph and the applicant all were concerned with the same problem related to number generation.
- b. The differences between probabilistic and deterministic functions are not of importance to the instant invention or to the combination of Resnikoff and Balph. Neither the applicant nor Resnikoff disclose the criticality of the function being probabilistic or deterministic. In the instant case, issue simply involves the substitution of the number generator disclosed in Resnikoff with that disclosed by Balph. Resnikoff glaringly states that other functions may be used [*See, Column 5 Lines 62-68*] and is not particular about the function being probabilistic. Furthermore, the applicant also is not particular about the function being probabilistic or deterministic [*See specification, Page 12, Lines 6-9*]. If it was critical to use only one of a probabilistic or deterministic function, the applicant would have eluded to it by at least providing some reasoning for the criticality, instead of providing a

vague suggestion of non-substitutability as put forth in the appeal brief. Based on the facts presented in the applicant's disclosure (and remarks) and Resnikoff, Examiner contends that the combination of Resnikoff and Balph merely substitutes one number generator with another and no criticality is assigned to the function being probabilistic or deterministic. Since, Balph is in the same problem solving area as set forth in the response to item 1(a) above, the combination of Resnikoff and Balph should be deemed proper.

2. No Suggestion or Motivation Found; Misinterpretation of Balph's Object

- a. Examiner contends it is well established that linear-feedback shift registers (LFSRs) reduce logic in applications related to number generation. Hence, when Balph discloses the minimization of logic, he states it in the general sense and merely reiterates what is well known. However, in order resolve this issue Examiner provides additional references to affirm the Examiner's assertions. This should not be construed as a new ground of rejection, since the claims are still rejected with the combination of Resnikoff and Balph. Furthermore, the newly cited reference is added merely as evidence to the prior statement made by the examiner, where the LFSRs was said to minimize logic, which was challenged for the *first time* in the appeal brief, this citation of the reference in the examiner's answer should not constitute a new ground of rejection within the meaning of 37 CFR 41.39(a)(2). See *In re Hoch*, 428 F.2d 1341, 1342 n.3, 166 USPQ 406, 407 n. 3 (CCPA 1970). In the NPL document titled "What's an LFSR?", it glaringly disclosed that LFSRs minimize logic, since the only signal need for number generation is a clock [See Page 1,

*Paragraph 3*]. Further, in the NPL document titled “Linear Feedback Shift Register”, it is again glaringly disclosed that LFSRs reduce logic, where a LFSR based design is said to have *area* advantages [*Page 1, Paragraph 3*].

- b. (2.b.1) Examiner concurs that Uniform and Poisson distributions are different, but that does not bar one from replacing a Poisson distribution with a Uniform distribution. Especially, when Resnikoff explicitly states that such replacement is permissible [*See, Column 5, Lines 62-68*].
- (2.b.2) First, the applicant provides does not evidence or citation in the Resnikoff patent that may suggests any undesirable effects resulting from replacement the Poisson distribution. Second, the Examiner find evidence to the contrary, where Resnikoff explicitly states that other distributions may be used [*See, Column 5 Lines 62-68*].
- (2.b.3) Examiner is unclear as to what limitation is not met by the combination of Resnikoff and Balph; the applicant has not stated any limitations were not met by the combination.

### ***(11) Related Proceeding(s) Appendix***


No decision rendered by a court or the Board is identified by the examiner in the Related Appeals and Interferences section of this examiner’s answer.

For the above reasons, it is believed that the rejections should be sustained.


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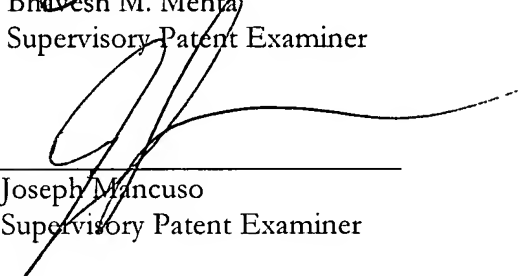
Respectfully submitted,

Dated: December 21, 2005

  
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